

Amendments to the Claims:

Following is a complete listing of the claims pending in the application, as amended:

1-50. (Canceled.)

51. (Currently Amended) A method in a portable computer for providing information about a context that is modeled with multiple context attributes, the method comprising:

receiving from each of multiple sources an indication of an ability to supply values for at least one of the context attributes of the modeled context; and

for each of multiple clients,

receiving an indication of a desire to receive information of interest;

when at least one source is determined to have the ability to supply the indicated information of interest, retrieving the indicated information from at least one of those sources and sending the retrieved information to the client, the sent information including a value of a context attribute corresponding to the indicated information of interest and additional information specific to that context attribute value that describes that context attribute value; and

when none of the sources have the ability to supply the indicated information of interest,

determining one or more resources of other accessible computers with which the indicated information of interest can be obtained;

obtaining the indicated information of interest with the determined resources; and

sending the obtained indicated-information to the client.

52. (Original) The method of claim 51 wherein the determined resource is processing capabilities of at least one other computer, and wherein the obtaining of the

indicated information with the determined resource includes use of the processing capabilities.

53. (Original) The method of claim 51 wherein the determined resource is an input device of at least one other computer, and wherein the obtaining of the indicated information with the determined resource includes receiving input information from the input device.

54. (Canceled.)

55. (Original) The method of claim 51 wherein at least one of the clients indicating a desire to receive indicated information is a characterization module.

56. (Canceled.)

57. (Original) The method of claim 51 wherein the context that is represented is a current context.

58. (Original) The method of claim 51 wherein the context attributes represent information about a user of the portable computer.

59. (Previously Presented) The method of claim 51 wherein the context attributes represent information about the portable computer.

60. (Previously Presented) The method of claim 51 wherein the context attributes represent information about a group of users such that each of the users is a user of one of the other accessible computers.

61. (Previously Presented) The method of claim 51 wherein the context attributes represent information about the group of other accessible computers.

62. (Previously Presented) The method of claim 51 wherein receiving of the sent obtained information by the client prompts the client to present information to a user.

63-65. (Canceled.)

66. (Currently Amended) The method of claim 51 wherein each of the sources are is one of a modules executing on the portable computer or are a devices of the portable computer.

67. (Previously Presented) The method of claim 51 wherein each of the clients are modules executing on the portable computer.

68. (Previously Presented) The method of claim 51 wherein the information of interest is a value of one of the context attributes.

69. (Previously Presented) The method of claim 51 wherein the received indication of the ability to supply values from each of the multiple sources is a registration message from that source.

70. (Previously Presented) The method of claim 51 wherein the received indication of the desire to receive information of interest from each of the multiple clients is a registration message from that client.

71. (Previously Presented) The method of claim 51 including verifying security information for each of the resources before the obtaining of the indicated information with those determined resources.

72. (Previously Presented) The method of claim 51 including verifying security information for each of the resources before supplying indicated information obtained from that resource to one of the clients.

73. (Previously Presented) The method of claim 51 wherein the sending of the obtained indicated information to the client includes sending the obtained information to an output device of a computing device for the client such that the obtained information will be presented via the output device.

74. (Currently Amended) A computer-readable medium containing instructions that when executed cause a computing device to provide information about a context that is modeled with multiple context attributes, by performing a method comprising:

for each of multiple clients,

receiving an indication from the client of a desire to receive information one or more values of one of the context attributes of interest if those values become available;

receiving indications from each of one or more sources local to the portable computer of one or more values for one or more context attributes, the indications sent by the local sources based at least in part on changes in the values and without having received a corresponding request for those context attribute values;

when at least one of the local sources is determined to have an ability to supply the indicated information supplies one or more values for the context attribute of interest, receiving the indicated information from at least one of those sources and sending the received information supplied context attribute values to the client; and

when the indicated information is one or more values for the context attribute of interest are not received from at least one of the local sources,

determining one or more resources of one or more other accessible computers with which the indicated information one or more values for the context attribute of interest can be obtained;

obtaining the indicated information one or more values for the context attribute of interest with the determined resources; and

sending the obtained indicated information context attribute values to the client.

75. (Currently Amended) A portable computer for providing information about a context that is represented with multiple modeled attributes, comprising:

an attribute mapping module that is capable of receiving from each of multiple sources local to the portable computer an indication of a current ability to supply values for at least one of the context attributes of the modeled context; and

an information supplier module that is capable of receiving context attribute values from sources and caching those received context attribute values for later use, of receiving an indication of a desire to receive information of interest from a client, of sending one or more of the cached context attribute values to the client if those cached context attribute values correspond to the indicated information of interest, and of, receiving if the cached context attribute values do not correspond to the indicated information of interest, obtaining the indicated information of interest from a local source when at least one if the source has the ability to supply the indicated information of interest and sending the received information to the client, and of, when if none of the local sources have the ability to supply the indicated information of interest, determining one or more resources of one or more other accessible computers with which the indicated information of interest can be obtained, obtaining the indicated information of interest with the determined resources, and sending the obtained indicated information of interest to the client.

76. (Previously Presented) A method in a wearable computer for an executing user characterization system to provide information about a current state of a user of the wearable computer, the user characterization system modeling the current state with multiple state attributes and including state server modules (SSMs) to supply values for the state attributes, state client modules (SCMs) to process values for the

state attributes, and an intermediary module to facilitate exchange of state attribute values, comprising:

under control of each SSM, generating values for at least one of the state attributes and sending the generated values to the intermediary module;

under control of each SCM, receiving values for at least one state attribute from the intermediary module and performing processing based on the received values;

under control of the intermediary module, facilitating exchange of values by,

receiving values for the state attributes from SSMs and from a first of multiple other characterization systems, each of the other characterization systems executing on another computer to model a current state related to the another computer;

receiving requests for values of indicated state attributes from SCMs and from a second of the other characterization systems;

sending values of the indicated state attributes to the SCMs and the second other characterization system; and

accessing functionality of a remote resource that is available to one of the other characterization systems executing on another computer by,

receiving a request related to access to the functionality of the resource;

requesting the one other characterization system to provide the access; and

after the one other characterization system provides the access, accessing the functionality of the resource,

so that the user characterization system can interact with other characterization systems in order to exchange state information of interest and access functionality of remote resources.

77. (Previously Presented) The method of claim 76 wherein the resource is processing capabilities of the another computer, wherein the accessing of the functionality of the resource includes use of the processing capabilities on behalf of the

user characterization system, and including receiving an indication of results of the use of the processing capabilities.

78. (Previously Presented) The method of claim 76 wherein the resource is an input device of the another computer, and wherein the accessing of the functionality of the resource includes receiving input information from the input device.

79. (Previously Presented) The method of claim 76 wherein the accessing of the functionality of the resource includes retrieving information used during the executing of the one other characterization system.

80. (Previously Presented) The method of claim 76 wherein the resource is a sensor of another computer that is receiving information about the user of the wearable computer, and wherein the accessing of the functionality of the resource includes obtaining information about the user of the wearable computer that is received by the sensor.

81. (Previously Presented) The method of claim 76 wherein the resource is an output device of another computer that is perceivable by the user of the wearable computer, and wherein the accessing of the functionality of the resource includes presenting information to the user on the output device.

82. (Previously Presented) The method of claim 76 wherein the accessing of the functionality of the resource is performed to receive values of at least one of the state attributes.

83. (Previously Presented) The method of claim 76 wherein the accessing of the functionality of the resource is performed to send values of at least one of the state attributes.

84. (Previously Presented) The method of claim 76 wherein the received request is for the functionality of the resource.

85. (Previously Presented) The method of claim 84 wherein the received request is for a value of an indicated state attribute, and wherein the accessing of the functionality of the resource includes obtaining the requested value.

86. (Previously Presented) The method of claim 76 including accessing multiple remote resources to obtain distributed state information.

87. (Previously Presented) The method of claim 86 including modeling an aspect of the current state using the distributed state information.

88. (Previously Presented) The method of claim 76 including, after the accessing of the functionality of the resource, responding to the received request related to the access.

89. (Previously Presented) The method of claim 76 wherein at least some of the SSMS are available to supply values for additional state attributes of a current state other than for the user, and wherein the intermediary module additionally sends values for the additional state attributes to SCMs based on indications from those SCMs of a current desire to receive values for at least one of the additional state attributes.

90. (Currently Amended) A method in a first computer for providing information about a current state that is represented with multiple attributes, the method comprising:

receiving indications of multiple characterization modules that each model a current state related to a computer on which that characterization module executes, each modeled current state represented with ~~at least one~~ multiple attributes each

having one or more values, at least some of the attribute values each having associated additional information that describes that attribute value;

determining a need for access to a resource accessible to one of the computers on which one of the characterization modules is executing, the determining based at least in part on one or more of the values of the multiple attributes that represent the modeled current state for the one characterization module and on the associated additional information for at least one of the one or more attribute values; and

using the one characterization module to access the resource.

91. (Previously Presented) The method of claim 90 wherein the determining of the need for access to the resource is based on receiving a request related to the access.

92. (Previously Presented) The method of claim 90 wherein the need for access to the resource is based on obtaining functionality provided by the resource.

93. (Previously Presented) The method of claim 90 wherein the resource is processing capabilities of the one computer, and wherein the accessing of the resource includes use of the processing capabilities.

94. (Previously Presented) The method of claim 90 wherein the resource is an input device of the one computer, and wherein the accessing of the resource includes receiving input information from the input device.

95. (Previously Presented) The method of claim 90 wherein the resource is an output device of the one computer, and wherein the accessing of the resource includes presenting output information via the output device.

96. (Previously Presented) The method of claim 90 wherein the resource is information used during the executing of the one characterization module, and wherein the accessing of the resource includes retrieving the information.

97. (Previously Presented) The method of claim 90 wherein the resource is a sensor of a computer distinct from the first computer that is receiving information about a user of the first computer, and wherein the accessing of the resource includes obtaining information about the user that is received by the sensor.

98. (Previously Presented) The method of claim 90 wherein the resource is an output device of a computer distinct from the first computer that is perceivable by a user of the first computer, and wherein the accessing of the resource includes presenting information to the user on the output device.

99. (Previously Presented) The method of claim 90 wherein the received indications of the multiple characterization modules are registration messages from each of the multiple characterization modules that indicate attributes that represent the current state modeled by that characterization module.

100. (Previously Presented) The method of claim 90 wherein the accessing of the resource is performed to send values of at least one of the attributes to the one characterization module.

101. (Previously Presented) The method of claim 90 including accessing multiple remote resources to obtain distributed state information.

102. (Previously Presented) The method of claim 101 including modeling an aspect of the current state using the distributed state information.

103. (Previously Presented) The method of claim 90 wherein at least some of the multiple attributes represent information about a user of the first computer.

104. (Previously Presented) The method of claim 103 wherein the represented information reflects a modeled mental state of the user.

105. (Previously Presented) The method of claim 90 wherein at least some of the multiple attributes represent information about the first computer.

106. (Previously Presented) The method of claim 90 wherein at least some of the multiple attributes represent information about a physical environment of a user of the first computer.

107. (Previously Presented) The method of claim 90 wherein at least some of the multiple attributes represent information about a cyber-environment of a user of the first computer.

108. (Previously Presented) The method of claim 90 wherein at least some of the multiple attributes represent a current prediction about a future state.

109. (Previously Presented) The method of claim 90 wherein at least some of the multiple attributes represent information about a group of users such that each of the users is a user of a computer on which one of the multiple characterization modules is executing.

110. (Previously Presented) The method of claim 90 wherein at least some of the multiple attributes represent information about the group of computers on which the multiple characterization modules are executing.

111. (Previously Presented) The method of claim 90 wherein at least some of the multiple attributes represent information about a physical environment common to the computers on which the multiple characterization modules are executing.

112. (Previously Presented) The method of claim 90 wherein at least some of the multiple attributes represent information about a cyber-environment common to the computers on which the multiple characterization modules are executing.

113. (Previously Presented) The method of claim 90 wherein security information must be received for the one characterization module before that characterization module is used to access the resource.

114. (Previously Presented) The method of claim 90 wherein security information must be supplied to the one characterization module before that characterization module is used to access the resource.

115. (Previously Presented) The method of claim 90 wherein the using of the one characterization module to access the resource includes requesting the one characterization module to access the resource on behalf of a module performing the method.

116. (Previously Presented) The method of claim 90 wherein the using of the one characterization module to access the resource includes requesting the one characterization module to provide information obtained from the resource.

117. (Previously Presented) The method of claim 90 wherein the using of the one characterization module to access the resource includes requesting the one characterization module to provide information to the resource.

118. (Previously Presented) The method of claim 90 wherein the using of the one characterization module to access the resource includes requesting the one characterization module to provide access information for the resource, and including accessing the resource using the provided access information.

119. (Previously Presented) The method of claim 90 wherein the accessing of the resource includes obtaining a value of at least one of the attributes that represent the current state modeled by the one characterization module.

120. (Previously Presented) The method of claim 119 including providing the obtained value to a client.

121. (Previously Presented) The method of claim 119 including providing the obtained value to another of the characterization modules.

122. (Previously Presented) The method of claim 90 including using information obtained from the accessing of the resource to provide functionality to clients.

123. (Previously Presented) The method of claim 90 including providing information obtained from the accessing of the resource to clients.

124. (Previously Presented) The method of claim 90 including receiving values of the attributes from sources and providing values of the attributes to clients.

125. (Previously Presented) The method of claim 124 wherein at least some of the sources are the characterization modules.

126. (Previously Presented) The method of claim 124 wherein at least some of the clients are the characterization modules.

127. (Currently Amended) A computer-readable medium whose contents cause a computing device to provide information about a state that is represented with multiple attributes, by performing a method comprising:

determining multiple modules that each model a state related to a computer on which that module executes, each modeled state represented with at least one attribute;

accessing a resource using one of the modules that is executing on a computer having access to the resource in order to obtain information regarding the modeled state of a computer, the obtained information including at least one value for at least one attribute representing the modeled state and associated additional information that describes at least one of those attribute values; and

using the information obtained from the accessing of the resource to provide functionality or information to a client.

128. (Previously Presented) The computer-readable medium of claim 127 wherein the computer-readable medium is a memory of the computing device.

129. (Previously Presented) The computer-readable medium of claim 127 wherein the computer-readable medium is a data transmission medium transmitting a generated data signal containing the contents.

130. (Previously Presented) A computing device for providing information about a current state that is represented with multiple attributes, comprising:

an input module that is capable of receiving indications of multiple characterization modules that each model a current state related to a computer on which that characterization module executes, each modeled current state represented with at least one attribute; and

a resource access module that is capable of determining a need for access to a resource accessible to one of the computers on which one of the characterization

modules is executing and of accessing the resource via the one characterization module.

131. (Previously Presented) A computing device for providing information about a current state that is represented with multiple attributes, comprising:

means for receiving indications of multiple characterization modules that each model a current state related to a computer on which that characterization module executes, each modeled current state represented with at least one attribute;

means for determining a need for access to a resource accessible to one of the computers on which one of the characterization modules is executing; and

means for accessing the resource via the one characterization module.

132. (New) The method of claim 51 wherein the received indications from each of the multiple sources of the ability to supply values for at least one of the context attributes of the modeled context includes indications of one or more available values for those context attributes, wherein the received indication of a desire to receive information of interest for a client is an indication from the client of a desire to receive one or more values of one of the context attributes of interest if those values become available, and wherein the retrieving of the information from a source is performed after a received indication from that source indicated one or more available values of the context attribute of interest.

133. (New) The method of claim 51 including receiving context attribute values from sources and caching those received context attribute values for later use, and wherein the retrieving of information from at least one source for information indicated to be of interest for a client is performed only if the cached context attribute values do not correspond to the indicated information of interest.

134. (New) The method of claim 51 wherein each of the sources is local to the portable computer.

135. (New) The method of claim 51 wherein, when none of the sources has the ability to supply the indicated information of interest, the obtained information sent to the client includes a value of a context attribute corresponding to the indicated information of interest and additional information specific to that context attribute value that describes that context attribute value.

136. (New) The method of claim 51 wherein, when a source is determined to have an ability to supply information indicated to be of interest by a client, the retrieving of the information from the source includes retrieving from the source the context attribute value and the additional information specific to that context attribute value that are to be sent to the client.

137. (New) The method of claim 51 wherein the additional information specific to a context attribute value that describes that context attribute value includes one or more of an indication of uncertainty of that context attribute value, an indication of accuracy of that context attribute value, an indication of a time associated with creation of that context attribute value, an indication of a time at which that context attribute value is most accurate, an indication of a time at which that context attribute value is retrieved from a source, and an indication of a time at which that context attribute value is sent to a client.

138. (New) The method of claim 51 wherein the additional information specific to a context attribute value that describes that context attribute value includes one or more of an indication that the context attribute value is a constant, an indication of a restriction on availability of the context attribute value to one or more indicated clients, an indication of a data type of the context attribute value, an indication of units of the context attribute value, an indication of a format of the context attribute value, an indication of a version of the context attribute value, an indication of a technique used to generate the context attribute value, an indication of whether the context attribute value is a new value, an indication of the source of the context attribute value, an indication of

a cost of using the context attribute value, an indication of one or more other clients to whom the context attribute value has been sent, and an indication of a rating for the context attribute value from one or more other clients.

139. (New) A method in a portable computer for providing information about a context that is modeled with multiple context attributes, the method comprising:

receiving from each of multiple sources local to the portable computer an indication of an ability to supply values for at least one of the context attributes of the modeled context; and

for each of multiple clients,

receiving an indication from the client of a desire to receive one or more values of a context attribute of interest; and

after sending to the client one or more values of the context attribute of interest that are obtained from one or more of the local sources,

receiving an indication of an ability to obtain one or more values for the context attribute of interest using one or more resources of one or more other accessible computers;

obtaining one or more values for the context attribute of interest via one or more of those resources of the one or more other accessible computers; and

sending the obtained context attribute values to the client.

140. (New) The method of claim 139 wherein the obtaining of the one or more values for the context attribute of interest via one or more of those resources of the one or more other accessible computers is performed only when none of the local sources has the ability to supply values of the context attribute of interest.

141. (New) A method in a portable computer for providing information about a context that is modeled with multiple context attributes, the method comprising:

receiving from each of multiple sources local to the portable computer an indication of an ability to supply values for at least one of the context attributes of the modeled context; and

for each of multiple clients,

receiving an indication from the client of a desire to receive one or more values of a context attribute of interest from one or more indicated sources; and

when one of the indicated sources is determined to have the ability to supply the one or more values of the context attribute of interest, obtaining one or more values of the context attribute of interest from the one indicated source and sending the obtained context attribute values to the client; and

when it is determined that one or more values of the context attribute of interest can be obtained using one or more resources of one or more other accessible computers,

obtaining one or more values of the context attribute of interest via one or more resources of the one or more other accessible computers; and

sending the obtained context attribute values to the client.

142. (New) The method of claim 141 wherein the obtaining of the one or more values for the context attribute of interest via the one or more resources of the one or more other accessible computers is performed only when none of the indicated sources has the ability to supply values of the context attribute of interest.

143. (New) The method of claim 141 wherein the one or more indicated sources are each one of the local sources.